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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/041,896	01/07/2002	Brenda D. Kraus	MI22-1859	5572

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EXAMINER

HUYNH, YENNHU B

ART UNIT PAPER NUMBER

2813

DATE MAILED: 03/25/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/041,896

Applicant(s)

KRAUS ET AL.

Examiner

Yennhu B Huynh

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-28 and 64-75 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-28 and 64-75 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the Amendment filed on 12/30/03.

Claims 1-20, 29-41 & 57-63 and 42-56 have been cancelled by Amendments filed on 4/16/02, 5/13/02 and 8/12/02.

Election/Restrictions

Applicant's election without traverse of claims 21-28 in Paper No. 9 is acknowledged.

Applicant's arguments with respect to claims 21-28 and 64-75 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-27 & 66-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsu et al. (U.S. 6,294,420B1) in view of Dornfest et al. (U.S. 6,358,810B1).

Tsu et al. disclose a novel integrated circuit capacitor, which include:

-Re. claims 21-23, 74 & 75: an array of wordlines 56a - 56d forming gate of FET and an array of bit lines 60, individual FET comprising a gate (col.7 & 8, lines 63-5, col. 9, lines 12-20, figs. 4 & 5); a plurality of memory cell storage capacitors associated with the field effect transistors, individual storage capacitors comprising a first capacitor electrode 12 in electrical connection with one of a pair of source/drain regions of one of the FET and a second capacitor electrode 14, a capacitor dielectric region 16; the region received intermediate the first and second capacitor electrodes, the region comprising nitride layer 22, the other of the pair of source/drain regions of the one field effect transistor being in electrical connection with one of the bit lines 60; wherein the bit lines are received elevationally outward of the memory cell storage capacitors (figs.4,5, col. 8 & 9, lines 14-42).

However, Tsu et al. do not disclose wherein the region contacts each of the first and second capacitor electrodes and consists essentially of AlN and a native oxide formed on at least one of the first and second capacitor electrodes.

Dornfest et al. disclose a multi-layer semiconductor memory device, which include wherein the region contacts each of the first capacitor electrode layer 44 and second capacitor electrode layer 36 and consists essentially of AlN and a native oxide formed on at least one of the first and second capacitor electrodes (col.34-49 and col. 4 lines 18-68)

It would have been obvious to one having skill in the art at the time the invention was made to modify the invention of Tsu et al. by incorporating wherein the region contacts each of the first capacitor electrode layer and second capacitor electrode layer

Art Unit: 2813

and consists essentially of AlN, to obtain a thin film insulator at a high temperature by its electrical properties

Claims 28,64 & 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsu et al. (U.S. 6,294,420B1) in view of Carpenter (U.S. 5,183,684).

Tsu et al. disclose substantially all claimed invention, except wherein the AlN is substantially amorphous.

Carpenter disclose a multi layer coating AlN to produce capacitors, which include;

-Re. claims 28,64 & 65: the amorphous AlN is formed (col.7 & 8, lines 59-68)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the invention of Tsu et al. by incorporating the AlN material being amorphous to reduce carbon and oxygen.

— With respect to claims 24-27 and 66-73 a range of region thickness less than or equal to 50 or 60 angstroms.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to optimize and select an appropriate thickness for the deposition. The selection of reaction parameters such as temperature, time, depth, thickness and concentration would have been obvious and involve routine optimization which has been held to be within the level of ordinary skill in the art.

"Normally, it is to expected that a change in temperature, or in range, concentration, cycles, thickness, would be an unpatentable modification. Under some circumstance, however, changes such as these may be impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different

Art Unit: 2813

in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality ... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller 105 USPQ233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmischer 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

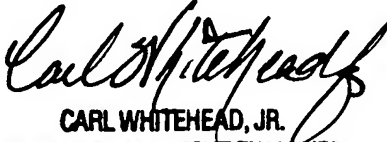
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yennhu Huynh whose telephone number is (703)308-6110. The examiner can normally be reached on Monday-Friday from 8:00 AM to 4.30PM.

If attempts to reach the examiner by telephone are unsuccessfully, the examiner's supervisor, Carl Whitehead, Jr., can be reached on (703) 308-4940. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-3432.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

YNBH,
3/20/03


CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800